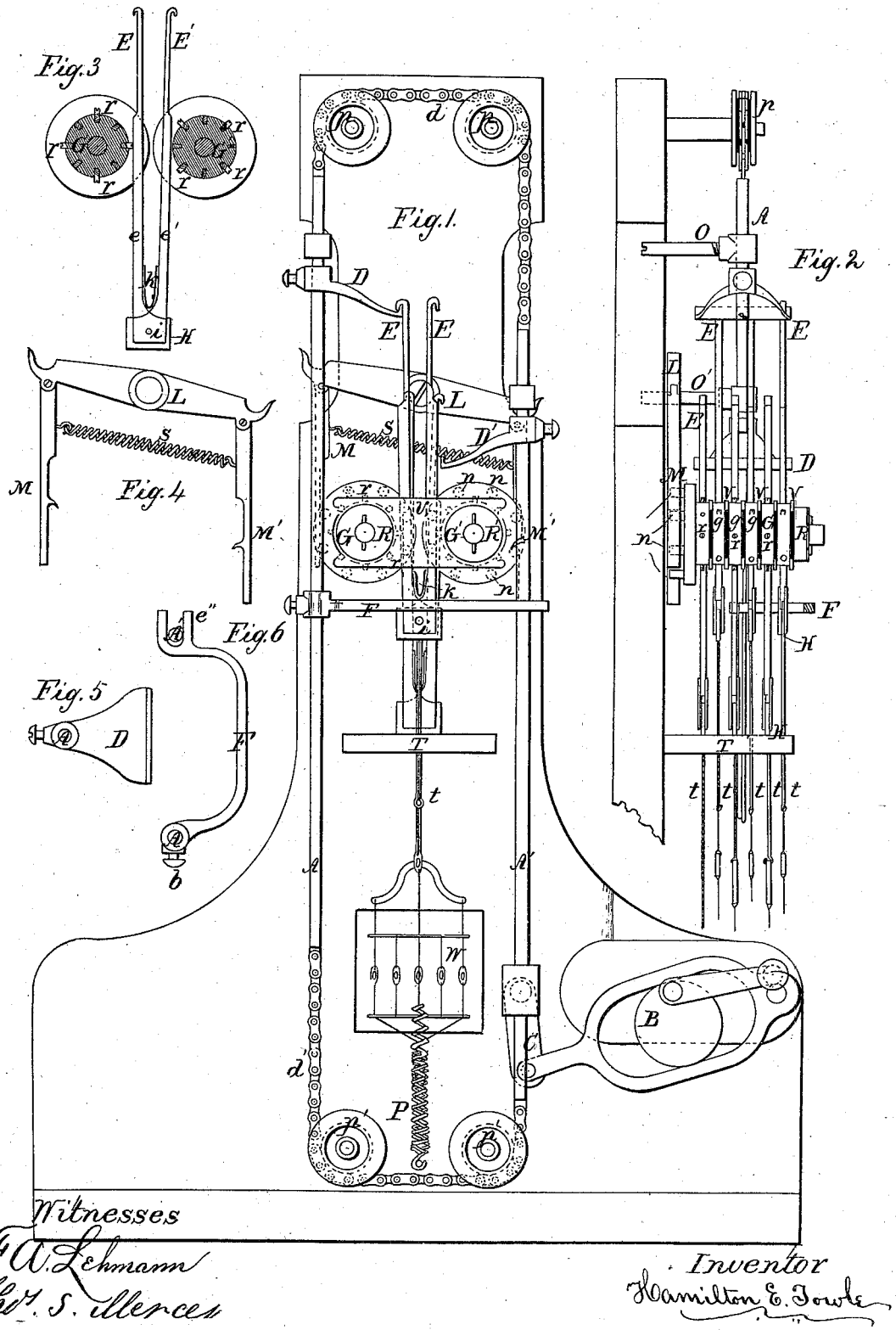
H. E. Towles.

Loom.

No. 111,278. Patented Jan. 24, 1871.



United States Patent Office.

HAMILTON E. TOWLE, OF NEWARK, NEW JERSEY.

Letters Patent No. 111,278, dated January 24, 1871.

IMPROVEMENT IN LOOMS.

The Schedule referred to in these Letters Patent and making part of the same.

To whom it may concern:

Be it known that I, HAMILTON E. TOWLE, of the city of Newark, county of Essex and State of New Jersey, have invented a new and useful Improvement in Looms, of which the following is a specification.

This improvement relates more particularly to the Jacquard or mechanism for operating the harness, and its object is to construct a simple and cheap Jacquard, that may be used for each separate chain of warps in looms for weaving narrow goods, instead of operating all the chains by a common harness, so that, should any obstruction occur to the weaving in the web, all the others will operate and it only be stopped, thus saving very much time.

The nature of this invention is as follows:

The harness, or that arrangement which carries the warp of the fabric, is attached by rods or cords to lifting hooks; these lifting hooks are joined together in pairs by a hinge or wrist through a hinge-plate, to which plates, as forming part of the pair of hooks, the harness is attached by means of the rods and cords aforesaid. The pairs of hooks, of which there may be any number, according to the work intended to be performed, are arranged in a row between two pattern-rollers or pattern-wheels, against which they rest, each hook being kept firmly against its roller by a spring between it and its mate, which rests against the opposite roller. Each of the two rollers receives an independent rotary motion, which may be given by means of a pawl and ratchet or otherwise.

On the rollers where they come in contact with the hooks are placed small screws or projections, which, as each roller rotates, press against the hooks, so as to push them away from the rollers at any point desired, in order that they may not engage with the lifters hereinafter described.

The lifters, of which there are two, one for each side of the row of hooks, consist of a hook-formed blade, broad enough to engage with all of the hooks on its side of the row fastened to a vertical rod. These vertical rods, there being one on each side, are united by chains working around pulleys, or simply by working-beams above and below. A vertical reciprocating motion is given to the rods, which causes the lifters to alternately ascend and descend, and engage with the hooks, (except such as may be thrown out of their reach by the projections or cams on the pattern-rollers,) and by this means to raise and lower the harness positively in both directions, or by weights or springs attached to produce motion in one direction, to draw it up or down steadily.

Description of the Accompanying Drawing.

Figure 1 is a front elevation of the mechanism;

Figure 2 is a side elevation;

Figure 3 is a vertical section through the pattern-rollers;

Figure 4 is a view of the working-beam removed from the machine;

Figure 5 is a plan of one of the lifters; and

Figure 6 is a plan of the guide for the lifting rod.

General Description.

A and A′ are the lifting rods, which are connected by chains *d* and *d′* working upon four pulleys, *p p* and *p′ p′*, two at the top and two at the bottom.

B is the eccentric, and

C is the connecting-rod, which operates the lifting rod A′.

D and D′ are the lifters, fastened to the lifting rods A and A′ by collars and set-screws for lifting the hooks E E.

O and O′ are arms projecting from the lifting rods A and A′, for the purpose of operating the working-beam L. The projecting arms are so arranged that as the rod A′ descends, the arm O′ will strike the working-beam L in the hook made to receive it, and depress that end of the beam with its pawl M′.

G and G′ are the pattern-rollers or pattern-wheels, and

n n are pins or teeth, of which there are eight or more on the end of each roller, with which the pawls M and M′ engage, thus giving alternately to each of the said rollers a rotary motion of one-eighth of a revolution at each alternate descent of the lifting rods and lifters. The part of a revolution made by the rollers may be more or less according to the length and position of the working beam and the number of pins on the ends of the rollers.

R and R′ are friction-washers, held on by a nut or pin, which, by means of the friction produced, prevent the rollers G and G′ from turning back by the friction of the pawls M and M′ on the pins *n n* in ascending.

In the rollers G and G′ opposite each hook, and corresponding to the part of a revolution which the roller makes at each descent of the lifting rods and lifters, are placed small screws with projecting heads *r r*, which act as cams to press upon the hook-arms *e e′* and throw the hooks E E′ away from the lifters D and D′. Therefore, at each point, when it is desired that the hook should remain down, a screw is put into the roller. Instead of these screws the rollers may have permanent projections or cams formed upon them to answer the same purpose, but the screws are preferred, for, while screws perform the office of solid cams, they can also easily be changed about, so as to act at different times as the pattern-rollers turn and the action of the hooks altered by this simple expedient of changing the number and position of the screws

on the rollers. The rollers receive their motion from opposite ends of the working-beam, and are entirely independent of each other. As one end of the working-beam with its pawl is depressed, the other is elevated, and the pawl set for the next pin on the roller, the pawls being kept in proper position to engage the pins by the spring S.

The hooks E E′ are arranged in pairs upon the hook arms *e e′*, hinge-jointed at the bottom to hinge-plates H, each by a single pin or rivet, *i*.

k is a spring, which serves to keep each pair of hooks pressed steadily apart against the rollers G and G′, and in a position to be raised by the lifter unless thrown or kept out of the reach of the lifter by one of the screws *r r*, or equivalent. To the hinge-plates H is fastened, by means of the rods or cords *t*, the harness W. Below the harness, fastened either to the floor or some stationary part of the machine, are weights or springs P, which serve to draw the harness and hooks down after being raised by the lifters.

T is a platform, which serves as a rest for the hinge-plates H H when they are down, and through which the cords or rods *t* pass.

Great advantage is obtained by combining and joining the hooks E E in pairs, inasmuch as by a proper arrangement of the screws *r r* on the rollers G and G′, the warp may be kept raised up or remain lowered while the shuttle makes one, two, or more passages, or the various parts of the warp may even be kept continually changing positions according to the fabric required to be produced; this arrangement of double hooks giving twice as many motions in same time as could be obtained from the use of single hooks.

V V are partition-plates, used to separate each pair of hooks and keep them in their proper vertical position, and also opposite the screws *r r*, which are intended to act upon them. These plates are held in position by being fitted into grooves *g g* in the rollers G and G′.

F is a guide for the lifting rod A, to resist its tendency to twist, which occurs whenever it happens that the hooks are so operating as to bring the weight of the harness unevenly upon the lifter. The guide consists of a bent arm fastened firmly at one end to the lifting rod A by a set-screw, *b*, and having at the other end a fork, *e″*, which can slide up and down upon a guide-rod or upon the opposite lifting rod A′.

Claims.

1. The lifting hooks hinged together, operating in pairs, and connected with the harness-frames, in combination with two reciprocating lifters, whereby particular heddles may be kept elevated by the alternate action of said lifters.

2. The harness-frames, the hinged lifting hooks, and the pair of pattern-rollers and reciprocating lifters, all arranged as described, and the pattern-rollers, operating independently each of the other.

3. The harness-frames, the hinged lifting hooks, the pair of pattern-rollers, and vibrating beam, with pawl arms and the reciprocating lifters, all constructed and operating together substantially as described.

Signed this 19th day of April, A. D. 1870.

HAMILTON E. TOWLE.

Witnesses:

F. A. LEHMANN,

THOS. S. MERCER.